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ABSTRACT

A two-phase investigation of characteristics associated with student achievement in elementary and secondary reading centers in the Houston (Texas) Independent School District is described and evaluated in this paper. After presenting background information about the centers, the paper describes the first phase of the investigation, which revealed a significant correlation between consultants' ratings of reading center characteristics and measures of student achievement, and explains the expanded rating procedures used in the second phase of the investigation. It then presents results of correlations of the two process evaluation procedures, a factor analysis of the rating scales used, and a regression analysis performed with data from the elementary reading centers. The paper concludes that the reading center process evaluation procedures constituted a rather weak predictor of student achievement, that the observation form showed promise but needed to be evaluated with a larger sample of centers, and that certain methodological problems needed to be overcome. Tables of data are included; appendixes present the procedural rating form used in the first phase of the investigation, a completed procedural rating form of the kind used in the second phase, and a reading center observation form. (GT)

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PROCESS CHARACTERISTICS ASSOCIATED WITH STUDENT ACHIEVEMENT IN REMEDIAL READING LABS

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PROCESS CHARACTERISTICS ASSOCIATED WITH STUDENT ACHIEVEMENT IN REMEDIAL READING LABS

John R. Pyper

Background Information

For the past several years, Reading Centers have been functioning in approximately 50 elementary schools and 25 secondary schools in the Houston Independent School District. These are full-time operations occurring in a specific room at each school staffed with a minimum of a teacher and an aide. Their purpose is to provide remedial instruction for students with reading difficulties. They are equipped with a variety of furniture, equipment, software, and other materials. Many centers have much of the same material and equipment, but across all centers the variance in the materials and equipment is rather substantial because the remedial reading "program" is not rigidly structured. The same is true of the instructional and management procedures occurring in the centers.

The large degree of variability of the program of the various centers is essentially due to a relatively low degree of precise specification of program procedures in the Reading Center Handbook which contains the official policies and procedures for the program. The major aspects of the Reading Center Program that are covered in the Handbook include the following:

- A general description of objectives and activities
- Criteria for admittance
- Guidelines for release
- Forms to be used
- Tests to be used "along with other teacher designed or selected instruments"
- A charge to group students
- Teacher service time activities
- Job descriptions of all positions from the Director of Reading to Reading Center Aide

Not included from the handbook is any detailed information regarding aspects such as the following:

- How diagnostic testing or progress check testing should occur.
- Specific objectives for students at various levels of deficiency.
- Prescriptions that should be implemented based upon diagnostic test results.
- How diagnostic test results and other background information should be used to group students.
- Activities and procedures to motivate students and provide incentives for self development.

In general, the above information was not included in detail apparently because it was presumed that the teachers selected to be Reading Center teachers have the appropriate skills in these areas because of training and also because there are a number of ideas and hypotheses about how remedial reading instruction should occur. Nevertheless, it was apparent to Research Department personnel as well as Reading Department personnel who had been observing the programs occurring in the various schools for the past several years that there were substantial differences among many centers. However, the correlation between student achievement and any observational or rating evaluations of the Reading Centers had not yet been directly investigated.

Phase I. 1976-77 Investigation

The achievement of the students at the Reading Centers during the 1976-77 school year was measured with the Gates-MacGinitie Reading Tests. The participating students were tested at the beginning and the end of their participation in the reading center program. Grade-equivalent scores of their performance on the Vocabulary and Reading Comprehension subtests were determined. Each student's rate of gain up to the beginning of their participation in the Reading Center program was determined as well as their rate of gain during their participation in the program. The general objective of the Reading Center Program was that 80% of the students would gain at a rate that was at least twice that manifest in their prior years of schools.

Four consultants from the HISD Reading Department visited the 76 centers throughout the year to evaluate the implementation of the program at each site and to render assistance. The aspects of the program that were focused upon are listed on a form that is contained in Appendix A. During the year and at the conclusion of the year, the consultants were asked to rank the centers into four categories--Outstanding, Above Average, Average, or Below Average. Very few of the centers were placed in the Below Average category. Approximately one-third of the centers were placed in each of the remaining three categories. The procedure for rating the centers was not precisely deliniated and in actuality was essentially an intuitive global assessment of each of the centers by the consultants based upon their repeated visits to each site and recollection of the characteristics manifest in each category of the Operational Procedure checklist.

Gates-MacGinitie Reading Test achievement data was gathered at a random sample of 19 of the 76 centers by the Research Department staff. The data from these schools was used to explore the degree of relationship between the consultants' ratings and the achievement of the students. The ratio of the rate of growth of reading ability during and before participation in the Reading Center program was found to vary widely from negative ratios to ratios sevenfold and greater. Therefore, the entire range of ratios was divided into five portions to ease the interpretability of the data. The five categories and the proportion of students falling into each of these categories are shown in Table 1.

TABLE 1

Percent of Reading Center Students in Various Categories of Ratio of Development of Reading Ability Before and During Participation in Reading Center Program

	N	Minus Change	0 to 1.00	1.01 to 2.00	2.01 to 4.00	4.00 or More
Elementary Sites						
Vocabulary	527	14%	24%	31%	25%	7%
Comprehension	525	14%	22%	22%	30%	10%
Secondary Sites						
Vocabulary	267	49%	14%	10%	15%	13%
Comprehension	26%	37%	12%	13%	21%	18%

The categories into which the 19 schools were ranked by the consultants were given numerical values of 1, 2, 3, or 4 (Outstanding = 1, Below Average = 4). The ranking of the schools were correlated with each of the five categories of the ratio scale, the proportion of students in that category being the "y-value" of the Pearsonian product-moment correlations. The category of greatest importance is that of the ratios between 2.00 to 4.00 because this range is that from a lower limit defined by the program objective to a reasonable upper limit. Ratios above 4.00 are rather extreme and are quite likely largely due to spuriously low pretest scores. In addition, however, to these five categories, category 1.01 to 2.00 was combined with 2.01 to 4 because the two combined represent a respectable range for a remedial reading program. Also, the two extreme categories, the negative ratios and the 4.00 or more category were combined to see the effect upon the correlation coefficient. The results are shown in Table 2.

TABLE 2

Correlations Between Consultation Ratings of the Proportion of Students at Various Levels of Change in Rate of Development of Reading Ability

Ratio of change in Rate of Development of Reading Ability	All Schs. (N=19)	Elem. Schs. (N=12)	Sec. Schs. (N=7)
Vocabulary			
0. Minus change	.39*	.39	.23
1. 0 to 1.00	.19	.46	.08
2. 1.01 to 2.00	-.52**	-.55*	-.12
3. 2.01 to 4.00	-.34	-.21	-.25
4. 4.00 or more	.07	.13	-.21
2 and 3 combined	-.54**	-.62*	-.27
0 and 4 combined	.38*	.41	.10
Comprehension			
0. Minus change	.33	.15	.22
1. 0 to 1.00	.47*	.70**	.81**
2. 1.01 to 2.00	-.53**	-.65**	-.19
3. 2.02 to 4.00	-.59**	-.53*	-.54
4. 4.00 or more	-.03	.01	-.46
2 and 3 combined	-.67**	-.76**	-.50
0 and 4 combined	.31	.18	-.01

* p .05

** p .01

The results appearing in TABLE 2 do indeed show that there is a significant correlation between consultant's ratings of reading center characteristics and measures of student achievement. The correlations that are significantly different from zero correlations at less than the .05 or .01 levels are somewhat robust. The small N of this investigation does substantially limit the intensiveness and generalizability of any consideration of the results.

The results of greatest importance regarding the successfulness of the centers are the proportion of students who fall in the change range from 2.00 to 4.00 and also the expanded range from 1.00 to 4.00. The correlations of the expanded range for both vocabulary and comprehension are both significant beyond the .01 level of probability. The elementary data suggests more stability than the secondary data, but the small N's and particularly the much smaller N of the secondary centers makes such an inference precarious. The greater number of significant correlations with the comprehension data suggests that comprehension test data are more valid and reliable than the vocabulary test data. However, much more investigation could and would be required.

Phase II. 1977-78 Investigation

The apparently substantial correlation between student achievement and supervisor ratings of reading center operational characteristics during the 1976-77 school resulted in an expanded investigation of this relationship during the 1977-78 school year. Not only were the number of centers to be involved expanded to all of the centers, but also the consultant's rating procedures were revised to be more objective and more valid and reliable.

Instrumentation.

The categories of the attributes of reading center program and facilities that were used during the 1977-78 school year were quite similar to those used in the 1976-77 school year. The final product that was developed for 1977-78 is contained in Appendix B. The instrument that is reproduced was one actually used during the year for one center. Almost all centers were observed and rated five times during the year. The first nine categories were rated using a five point scale (Categories I, II, and II were given a double weighting). Categories X through XIV were rated with a three point scale.

The 1977-78 rating procedure does represent a considerably more detailed approach than that for 1976-77. However, close examination of the instrument reveals that there are many aspects of it that could be much more objective. In many instances the phenomena to be rated is not precisely defined nor is it clear as to how one is to arrive at a rating of 1 to 5 or 1 to 3. Also, unfortunately, there is considerable overlap among several of the categories reducing their mutual exclusiveness and therefore their effectiveness. In view of these difficulties, an additional observation procedure was developed by HISD Research Department personnel with the intention of having a more objective procedure focusing on more discrete and precisely definable characteristics. That procedure is found in Appendix C.

The components contained in the Research Department Observation Form were included if they met three criteria.

a. They are precisely definable discrete behaviors, activities or characteristics.

b. They constituted characteristics that appear to be directly related to successful student achievement.

c. There was distinct variability between some centers in the degree to which these characteristics occur.

A few examples can illustrate why some of these specific characteristics were included.

Item 2. In some centers students went right to work at a prescheduled study area as soon as they entered the center. In others, there was milling around for several minutes after the tardy bell rang.

Item 4. In some centers the teacher was out among the students during most of the period. At other centers, the teacher sat behind her desk for almost the entire period.

Item 13. At some centers progress checks (tests over what the students were studying) occurred daily. At other centers, they may have occurred once at the end of a quarter grading period.

Implementation.

The Reading Department consultants utilized the "Rating Scale" (Appendix B) at all of the 76 centers in the school district (52 elementary sites and 24 secondary sites). The Research Department Observation Form, however, was used at only 10 sites (7 elementary and 3 secondary) because of its pilot status and personnel limitations. Unfortunately, the small number of centers at which both forms were used limits substantially the opportunity to compare the effectiveness of these two approaches.

Dependent Variable Characteristics

The measuring instrument for the dependent variable of student achievement for the 1977-78 school year was the same as that for the 1976-77 school year, the Gates-MacGinitie Reading Tests. Achievement during 1977-78 was defined the same as during 1976-77, namely, the ratio of the rate of growth of reading ability while enrolled in the reading center program as compared with the rate of growth of reading ability prior to entering the reading center.

The student achievement data for the 1977-78 school year was again plagued by too many students with extremely low or extremely high pretest scores which considerably reduces the reliability and validity of the data at least for those students. Further investigation of the 1976-77 data, as well as other data from low achieving students reveals that most of the unusually high or low changes in rate of gain while in the Reading Center program were largely due to extreme fluctuations in the performance of individual students on either the pretest or the posttest (and in some cases both.) For example, a posttest score lower than a pretest score will result in negative gain. Also an extremely low pretest score and a very high posttest score will result in a very dramatic positive change in the "rate of gain."

During the 1977-78 school year, the Reading Center teachers were to have been instructed to retest students whose pretest scores were quite low or quite high. (Since the Gates-MacGinitie Reading Tests consist of several ability levels, the next lower or next higher level should have been administered). Unfortunately, this procedure was not adequately implemented. TABLE 3 shows the number and percent of students whose pretest scores were extremely or extremely high. (These results are of half of the 76 centers which were randomly selected for evaluation purposes.)

TABLE 3

Number of Students Whose Pretest Scores Were
Extremely Low, Moderate or Extremely High

	VOCABULARY			COMPREHENSION		
Grade	Extremely Low	Moderate	Extremely High	Extremely Low	Moderate	Extremely High
1	29	54	7	45	41	4
2	29	200	85	36	233	45
3	12	156	108	23	162	91
4	9	167	106	12	181	89
5	9	159	99	13	182	72
6	10	136	87	7	158	68
7	73	98	25	82	107	7
8	36	69	22	28	83	16
9	27	39	16	22	40	20
10	137	48	12	103	82	12
11	54	38	8	53	39	8
12	24	28	10	25	28	9
TOTAL	449	1192	585	449	1336	441
Percent	(total)	(20%)	(26%)	(20%)	(60%)	(20%)

TABLE 4 shows the same kind of information for the 1977-78 data as TABLE 1 showed for the 1976-77 data, namely, the percentage of students falling in the various categories of the degree of change in rate of growth of reading achievement. TABLE 4 provides more detailed information because it also shows the distribution by status of the pretest score (as referred to in TABLE 3).

TABLE 4

Percent of Students in Various Categories of the Ratio of the Rate of Development of Reading Ability Before and During Participation in the Reading Center Program

	Pretest Score Status	N	Minus Change	0 to 1.00	1.01 to 2.00	2.01 to 4.00	4.01 or more
Grades 2-6 Vocabulary	Low	72	9%	18%	9%	20%	44%
	Mid	867	9%	17%	26%	36%	13%
	High	488	17%	36%	32%	14%	2%
	All	1427	12%	24%	27%	27%	10%
Grades 2-6 Comprehension	Low	99	3%	16%	20%	24%	38%
	Mid	952	12%	20%	26%	27%	16%
	High	366	19	28%	28%	22%	4%
	All	1417	13%	22%	26%	25%	14%
Grades 7-12 Vocabulary	Low	255	20%	6%	10%	16%	49%
	Mid	317	27%	9%	12%	17%	35%
	High	84	44%	10%	14%	21%	11%
	All	656	26%	8%	11%	17%	38%
Grades 7-12 Comprehension	Low	269	17%	5%	7%	14%	57%
	Mid	370	26%	9%	11%	19%	35%
	High	70	24%	11%	7%	27%	31%
	All	709	23%	7%	9%	18%	43%

This brief review of some aspects of the quality of the dependent variable of student achievement points out theneed to control the quality of the data as much as possible both during the initial colleciton of the data and later during the data analysis phase as well. The imperfection of this data will, of course, have their effect upon reliabilities of the analyses to be performed. Essentially, the effect will be to attenuate the degree to which student achievement effects are related to the individual reading center operations that did occur during the year.

Analysis and Results

The extensive number of analyses that can be considered will be presented as follows: First, the degree of relationship of the two process evaluation procedures will be compared. Second, the attributes of the Reading Department Rating Scale will be considered in detail since there is so much more data (ratings at 76 centers) for analysis. As will be seen later, the sample of 10 centers utilized with the Research Department Observation Form was inadequate for regression analysis.

The dependent variables for the regression analyses were the vocabulary and comprehension subtests of the Gates-MacGinitie Reading Tests. And more specifially, it was the proportion of students at each center whose change in rate of development of reading achievement was from 1.00 (no change) to 4.00. The vocabulary ratio's acronym is VRAOK and the comprehension one is CRAOK. Also, the two extreme categories of change in rate (below zero and more than fourfold change) were combined to see how well these extreme outcomes might be predicted. The vocabulary acronym is VRAWILD and the comprehension acronym is CRAWILD.

Observation Form and Rating Scale

TABLE 5 contains the correlations of the two process evaluation procedures with the dependent outcome variables defined above. How the various components of each of the two process evaluation procedures were combined into a global score were as follows:

a) Reading Department Rating Scale. First an average rating for each of the 14 categories was determined. (Usually 5 visits were made). Then the 14 ratings were added for a grand total.

b) Research Department Observation Form. Fourteen of the characteristics were judged to have yielded data that had stability and variability. The range of each characteristic was then adjusted to a range of about 10 points for all the characteristics that were considered to have equal weight. Three characteristics received half weighting. Then an average score (OFAVE) was determined of the characteristics observed at each school. (Six schools were missing data on one characteristic).

TABLE 5

(Correlations of Reading Center Rating procedures with achievement outcome indicators (N = 10 Centers)

	OFAVE	VRAOK	CRAOK	VRAWILD	CRAWILD
RSUM*	.71	.72	.32	-.48	-.52
OFAVE*	1.00	.78	.68	-.75	-.79
VRAOK*		1.00	.68	-.68	-.57
CRAOK*			1.00	-.11	-.72
VRAWILD*				1.00	.54

*See text

The results contained in TABLE 5 indicate that average score from the Research Department Observation Form correlates more highly with the dependent achievement measures than does the sum total score of the Reading Department Reading Scale. In particular it correlates much better with the comprehension variable and the extreme outcomes. The correlation of the RSUM variable with these dependent variables was also determined for all 36 centers in the "evaluation sample." Surprisingly the correlations were lower. They were:

VRAOK	.47
CRAOK	.39
VRAWILD	-.39
CRAWILD	-.37

Unfortunately because of the small number of centers evaluated with the Research Department Observation Form no further meaningful comparative evaluation of its effectiveness can be made. It is worth noting in passing that much of the variability in the criteria were between the elementary and secondary centers. Because of the rather dramatic differences the raw data for the 10 schools is shown in Appendix D.

The centers whose data appears in Appendix D are in approximate hierarchical order from outstanding to poor. The attributes that tend to characterize the centers with lower achievement are:

Item 2. Longer set-up time

Item 3. Lower teacher and aide time spent instructing students

Item 4. Lack of physical closeness to the students by the teacher

Item 6. Involvement in discipline problems

Item 7. Students not paying attention to learning tasks

Item 10. Lack of diagnostic test for all students

Item 11. Lack of skills checklist for all students

Item 13. Too much time between progress checks

Item 14. Low amounts of teacher service time

These characteristics are among those that distinguish teachers who are well organized, knowledgeable about effective remedial procedures, and who enjoy their students from teachers who are weak in these areas.

FACTOR ANALYSIS OF THE RATING SCALES

Preliminary analysis of each of the 14 scales of the Reading Department rating procedure indicated that six of the fourteen scales did not have correlations with VRAOK, CRAOK, VRAWILD, or CRAWILD that were significantly different from zero at the .05 level. These scales were 2, 6, 7, 10, and 13. The remaining eight scales did have significant correlations most of which were at least at the .03 level or better. The correlations ranged from the 30's to the mid 50's. Variables 1, 9, 11, and 12 had the highest correlations.

In view of the apparent weakness of several of the 14 categories and the observed overlap among the criteria of some categories of the Reading Department Rating Scales, it is quite apparent the factor analysis should be utilized to obtain factor scores to be utilized in further regression analysis. The Statistical Package for the Social Sciences (SPSS) Version 7 was used for the factor analysis and all further procedures reported in this paper.

Several differences between the elementary and secondary programs suggested that the factor structures of their ratings might be different. Major reasons were the following:

a) Numerous differences between the two levels of sites have been observed directly.

b) Student achievement measures differ markedly between the two levels.

c) One consultant evaluated all of the secondary sites whereas the elementary sites were evaluated by three consultants (each, however, with a unique set).

In view of these considerations discriminant analysis of the ratings of the 14 categories between the two groups was conducted. A step wise procedure was employed in which the variable selected at each step is the one that contributes the greatest increase in Rao's V, a generalized distance measure. The summary table of the discriminant analysis is shown as TABLE 6. The highlights of the analysis are:

a) Category 10 did not contribute to discrimination between the two groups at even minimal levels of inclusion.

b) Categories 1, 7, 12 contributed the most discriminating power.

c) The 13 categories that were included by the program criteria produced a discriminant function with a Wilks Lambda value of .53103 which its associated chi-square value of 42.72 with 13 degrees of freedom is significant beyond the .000 level.

The two groups do indeed differ substantially from one another and their data in factor analysis and regression analysis should be done separately.

Factor analysis of the two sets of data was then performed. The average rating over five visits for each of the 14 categories at each of the schools constituted the raw data from which factors were extracted by the principal factoring with iteration (SPSS PA2 method) procedure and rotated to the VARIMAX criterion with Kaiser normalization. The resulting factor structures (correlations of the factors with the original 14 categories) are shown in TABLE 7 (Elementary) and TABLE 8 (Secondary).

TABLE 6

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FILE NONAME (CREATION DATE = 79/01/31.)

- D I S C R I M I N A N T A N A L Y S I S -

SUMMARY TABLE

STEP NUMBER	VARIABLE ENTERED	VARIABLE REMOVED	F TO ENTER OR REMOVE	NUMBER INCLUDED	WILKS LAMBDA	SIG.	RAOS V	CHANGE IN RAOS V	SIG.
1	R1		17.66101	1	.80732	.000	17.66101	17.66101	.000
2	R7		16.38085	2	.65936	.000	38.22930	20.56829	.000
3	R12		4.14092	3	.62350	.000	44.68392	6.45461	.011
4	R4		2.18074	4	.60492	.000	48.32926	3.64534	.056
5	R9		2.01284	5	.58802	.000	51.84681	3.51756	.061
6	R2		1.09314	6	.57865	.000	53.84055	1.99374	.158
7	R5		1.02706	7	.57023	.000	55.77143	1.93088	.165
8	R3		1.13943	8	.56070	.000	57.97838	2.20695	.137
9	R8		.82778	9	.55375	.000	59.63367	1.65530	.198
10	R14		2.11660	10	.53629	.000	63.98519	4.35151	.037
11	R11		.41406	11	.53284	.000	64.87791	.89273	.345
12	R13		.16559	12	.53145	.000	65.24297	.36503	.546
13	R6		.04857	13	.53103	.000	65.35202	.10907	.741

NUMBER REMOVED	EIGENVALUE	CANONICAL CORRELATION	PERCENT OF TRACE	WILKS LAMBDA	CHI-SQUARE	D.F.	SIGNIFICANCE
0	.88314	.68481	100.0	.53103	42.72332	13	.000

17

19

20

TABLE 7
VARIMAX-Rotated Factor Pattern Coefficients of the Elementary Reading Centers

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
R1	.35943	.30326	.49027	.45950
R2	.02454	.88544	.17099	.18605
R3	.18154	.04072	.09235	.98371
R4	.47848	.12002	.49041	.49324
R5	.43074	.21392	.67636	.22059
R6	.10107	.89825	.25910	.18228
R7	.93523	.14151	.13075	.30824
R8	.42759	.10534	.54039	.23538
R9	.05384	.54221	.11965	.00631
R10	.14425	.21277	.25202	.62067
R11	.45977	.02316	.05307	.07262
R12	.69317	.09414	.26955	.03926
R13	.09909	.10431	.51812	.02601
R14	-.00550	.25372	.47134	.24969

TABLE 8
VARIMAX-Rotated Factor Pattern Coefficients of the Secondary Reading Centers

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
R1	.23287	.59907	.23271	.51374
R2	.03999	.22657	.94561	-.00002
R3	.26023	.65913	.29825	.41108
R4	.66544	.29514	.21068	.52364
R5	.05708	.80102	.32824	.52654
R6	.07025	.24013	.88424	.23136
R7	.80505	.41907	.16282	.23337
R8	.90025	.36588	.04193	.10564
R9	.82816	.05372	.10850	.35179
R10	.48252	.60645	.13193	.00025
R11	.30264	.61342	.13602	.42061
R12	.15130	.31223	-.07085	.57915
R13	.69061	.10911	-.08765	-.03521
R14	.25433	.90785	.00933	.00129

Cursory inspection of the two factor structures shows that there are substantial differences between the two. The loadings of the variables on each of the factors are considerably different between the two structures - except for Factor 2 of the elementary data and Factor III of the secondary data.

Interpretation of the meaning of factors is somewhat of an art. In attempting to interpret the factors that were produced, the loading of each category on a factor was of primary importance as well as the loading of a category across the factors, and also the similarity of the categories that had high a loading for a given factor. In view of these considerations (plus some background knowledge about the elementary and secondary centers and the consultants) the following labels were generated for the factors.

Elementary

1. Organization of materials
2. Utilization of aide
3. Instructional procedures
4. Attention to students

Secondary

1. Orderliness of Procedures
2. Time management
3. Utilization of aide
4. Orderliness of Forms

Precision in the interpretation of the factors is not a central nor critical issue at this point. Indeed it is premature. The rating procedures do not yet have the degree of stability and generalizability that they can have. Two of the factors of the elementary data and one of the factors of the secondary data are of dubious value because their eigenvalues are less than 1.00. At a minimum the analysis of the data to this point indicates a need for further refinement of the process evaluation procedures. (Unfortunately, data regarding interrater or intrarater reliablility estimates were not obtained which information, if available, would have been of substantial value).

Regression Analysis

Regression analysis was performed only with the elementary data at this time largely because an administrative decision resulted in major changes in the secondary reading center program. Therefore analysis of that data would be largely now of academic interest.

Two dependent variables were used in two separate and distinct analyses. These were the vocabulary and comprehension change in rate ratios in the "reasonbale range area," i.e., VRAOK and CRAOK that have been discussed and utilized earlier. The predictor variables were the following:

FS1 - Factor Score 1
FS2 - Factor Score 2
FS3 - Factor Score 3
FS4 - Factor Score 4
DAYH1 - The proportion of students who attended at least 61 days or more during year
$\bar{X}$ DAYX - The average number of days of attendance of all students during the year
VOK - Proportion of students whose vocabulary pretest score was in the mid-range of the test level
COK - Same as VOK but for the comprehension pretest score

VOK was only used as a predictor with the VRAOK variable and COK was only used with CRAOK. The number of centers that could be used dropped from 52 to 34 because of missing data (e.g., attendance data was missing).

A stepwise regression procedure was followed and the default options built into the SPSS procedure were accepted. The summary table of the vocabulary subtest data is TABLE 9 and the summary table of the comprehension subtest data is TABLE 10.

TABLE 9

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FILE NONAME (CREATION DATE = 79/01/17.)

* MULTIPLE REGRESSION *

DEPENDENT VARIABLE.. VKADK

SUMMARY TABLE

STEP	VARIABLE ENTERED	VARIABLE REMOVED	F TO ENTER OR REMOVE	SIGNIFICANCE	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIFICANCE
1	VOK		7.22280	.011	.43081	.18560	.18560	.43081	7.29250	.011
2	FS2		2.04440	.163	.48578	.23599	.05039	.11916	4.78751	.015
3	DAYH1		1.22883	.276	.51580	.26605	.03006	.34787	3.62541	.029
4	FS3		1.24139	.274	.54422	.29618	.03013	-.11034	3.05093	.043
5	DAYX		.30585	.585	.55117	.30378	.00760	.20385	2.44547	.059
6	FS1		.10128	.753	.55352	.30639	.00261	.05762	1.98775	.103
7	FS4		.06528	.801	.55508	.30812	.00173	-.27651	1.65402	.145

TABLE 10

READING CENTER ACH ANALYSIS B32AA 79/01/17. 14.18.32. PAGE 46

FILE NONAME (CREATION DATE = 79/01/17.)

* MULTIPLE REGRESSION *

DEPENDENT VARIABLE.. CRAOK

SUMMARY TABLE

STEP	VARIABLE ENTERED	VARIABLE REMOVED	F TO ENTER OR REMOVE	SIGNIFICANCE	MULTIPLE R	R SQUARE	R SQUARE CHANGE	SIMPLE R	OVERALL F	SIGNIFICANCE
1	FS2		5.86784	.021	.39366	.15496	.15496	.39364	5.86784	.021
2	FS4		.92312	.344	.42355	.17939	.02444	-.08652	3.38843	.047
3	FS3		.37380	.546	.43531	.18949	.01010	.05154	2.33792	.094
4	COK		.24424	.625	.44301	.19628	.00677	-.12041	1.77033	.162
5	FS1		.33104	.588	.45256	.20481	.00855	.32953	1.44234	.243
6	DAYM1		.14088	.710	.45710	.20894	.00413	.10689	1.18855	.342
7	DAYX		.05095	.807	.45912	.21079	.00185	-.00747	.99203	.459

22

26

27

The variable VOK is the strongest predictor of VRAOK accounting for about 19% of the variance. The variables FS2, DAY H1 and FS3 add modest amounts to the multiple R^2 but only raising it from .186 to .296. The variables FS1, FS4 and DAYX make very little contribution. With regard to the prediction of CRAOK, only the variable FS2 makes a substantial contribution accounting for 15% of the variance. FS4 makes a small contribution raising the multiple R^2 to .18 but the remaining variables add very little and the changes are not statistically significant.

CONCLUSIONS

These results add to the conclusion that the Reading Center process evaluation procedure constitutes a rather weak predictor of student achievement. The Research Department Observation Form showed some promise, but needs to be evaluated with a larger sample of centers observed. The problem of the relatively large percentage of students with extremely high or extremely low pretest scores needs to be overcome. One major improvement of the previous analyses would have been to have deleted these students altogether. Unfortunately this hindsight came too late to be able to modify this paper. This, however, will be the first order of business as soon as this conference is over.

JP/bc/mr

B-131

APPENDIX A

Center _____ Teacher _____

Date _____ Teacher-Aide _____

Time _____ Consultant _____

PRESCRIPTION LEARNING CENTER OPERATIONAL PROCEDURES

	Satisfactory	Recommendations
1. Lesson Plans		
2. Skills Check List		
3. Instruction		
4. Planning with Teacher-Aide		
5. Utilization of Materials		
6. Teacher Service-Time		
7. Physical Organization of Center		
8. Individual Student Files		
9. Report Cards		
10. No. of Pupils Served		
11. Schedule		
12. Discipline		

APPENDIX B

Rating Scale for Reading
Center Operational Procedures

SCHOOL Kenilworth
PRINCIPAL Mr Irving
TEACHER Icabod Crane
AIDE Chester
ENTOLLMENT IN READING CENTER _____
OBSERVER Yours Truely

10 = All of Time
8 = Most of Time
6 = Average
4 = Seldom
2 = Not at All
0 = Not Applicable

Questions	DATES OBSERVED 1-11-78 (1)	2-21-78 (2)	3/10 (3)	3/29-78 (4)	4/12-78 (5)
I. Instruction	8	8	10	10	10
1a. Time teaching on task while observed					
1b. Teacher places self to produce optimal instruction for all students					
1c. Materials are utilized at varying levels of difficulty during time observed					
1d. Evidence of orderly instruction					
a. preparation					
b. attention to skills deficit					
1e. Uses observation and/or other diagnostic techniques to insure mastery of specific skills					
. evidences use of skills check list					
. documentation of what skills are to be taught					
. documentation of progress toward attainment of skill					

Questions	DATES OBSERVED 1	2	3	4	5
II. Utilization of Teacher-Aide	10	10	10	10	10
2a. Involved in a variety of reinforcement activities					
2b. Moves about class or places self in position for optimal effectiveness for instruction for all students					
2c. Student assistance is given during class period observed					
2d. Materials presented are appropriate to the students' needs as observed					
2e. Utilizes a variety of techniques for reinforcing skills while observed . games . listening . reading to student . oral language exercise					
III. Student Involvement	10	10	10	10	10
3a. Students are working on task during the instructional period observed					
3b. Students enter the reading center, proceed through, and exit the center in an orderly fashion					
3c. Students are utilizing instructional materials and equipment					

5 = All of Time
4 = Most of Time
3 = Average
2 = Seldom
1 = Not at All
0 = Not Applicable

Questions	DATES OBSERVED 1	2	3	4	5
IV. Lessons Plans	4	4	4	3	3
4a. Plans match recommendations of individual students' diagnoses					
4b. Plans demonstrate the use of a variety of materials and techniques					
. over the week observed . over 2 weeks adjacent to the week observed					
4c. Plans provide for group discussion and group interaction					
. over a week . over 2 weeks adjacent to the week observed					
4d. Plans reflect reinforcement utilizing the reading aide					
4e. Instructional plans are comprehensible to the outside observer					
. legible					
V. Skills Checklist	5	5	5	5	5
5a. Evidence of utilization of skills checklist to identify students' needs					
5b. On-going diagnosis is evident through coding					
5c. Checklist is correlated with lesson plans					

Questions	RATES OBSERVED 1	2	3	4	5
VI. Planning With Teacher Aide	5	5	5	5	5
6a. Teacher-aide log reflects correlation with teacher's plan					
6b. Utilizes allotted time for planning with teacher-aide as reflected through daily schedule					
6c. Teacher's lesson plan reflects awareness of utilization of the expertise of the teacher-aide					
VII. Utilization of Materials — Folders needed updating	4	4	5	4	4
7a. Materials listed in students' folders reflect changes and up-dating					
7b. High interest materials are used					
7c. Demonstrates knowledge of correct use of materials and devices					
7d. Materials are relevant to diagnosis					
VIII. Individual Student Files — Files needed updating	4	4	5	5	5
8a. Files are current					
8b. Files are continuously updated					
8c. All pertinent and relevant information is included					
. Supplementary report cards					
. Test results (formal and informal)					
. Referral					
. Permanent Record					
8d. Contents are legible and easily accessible					
IX. Schedule	4	4	5	5	5
9a. Reflects appropriate instructional time (define)					
9b. Schedules are updated and visible					

Although a schedule was posted it was not the type designated by the Reading Department

3 = All to most of the time
2 = Average
1 = Seldom
0 = Not Applicable

Questions	DATES OBSERVED 1	2	3	4	5
X. Teacher Service Time	3	3	3	3	3
Activities are geared to correlate with Reading Guide Objectives					
Activities are directed to the needs of specific classrooms as evidenced in specialists' records					
XI. Physical Organization of Center (space for the Center is quite limited)	0	0	0	0	0
Appearance of Reading Center is conducive to learning					
. neat					
. colorful					
Learning stations as clearly defined					
XII. Supplmentary Report Cards	3	3	3	3	3
Comments define skills being emphasized					
Comments reflect on-going progress					
Comments reflect continuous positive reinforcement					
XIII. Number of Students Served	3	3	3	3	3
Students enrollment should range ± 100 students*					
Includes student tutor program enrollment*					
XIV. Discipline	3	3	3	3	3
Students demonstrate					
. attention to task					
. following instructions					
Activities are provided to aid in the development of self discipline					
. materials used are not too far above or below students' measured instructional level					

* ... school enroll... 100

APPENDIX C

Reading Center Observation Form

School _____ Dates Observed

1. Length of instructional period. (minutes)						
2. Average length of set-up time. (minutes)						
3. Time spent instructing:						
a. Teacher (% of 1.)						
b. Aide 1 (% of 1.)						
c. Aide 2 (% of 1.)						
d. Other volunteers (% of 1.)						
4.a. Does teacher place self near students as they work? No=0, Yes=1						
b. Percent of instructional period.						
5. Does aide spend part of period in clerical work and/or in finding children? (% of 1.)						
6. Amount of discipline by teacher or aide.						
a. Number of events						
b. Number of minutes						
7. Amount of time students are paying attention (average for group) (% of 1.)						
8. Percent of S's who are working with prescribed materials. (from diag. check list and perm. records)						
9. Percent of S's who are following the lesson plans.						
10. Percent of S's with current diagnostic test *(WART, LOGOS)						
11. Percent of S's with skills check list up-to-date						
12. Percent of S's with up-to-date list of remedial materials.						
13. Average length of time (days) between progress checks.						
14.a. Average number of students per period.						
b. Average percent of attendance.						
15. Total enrollment in Reading Center.						
16. Total enrollment in school.						

17. Dominant type of instructional grouping:

	A. Teacher	B. Aide
1.	Whole group	Whole group
2.	Small group	Small group
3.	Individual	Individual
4.	2 and 3	2 and 3

17A						
17B						

18. Teacher service time (average hours spent per week)

1. Testing for other teachers						
2. Informal sharing of materials						
3. Student instruction in classroom						
4. Instruction of a self-contained class in reading center.						
5. Total						

5P/b

APPENDIX D

	Elem Sch A	Elem Sch B	Elem Sch C	Elem Sch D	Sec Sch A	Elem Sch E	Elem Sch F	Sec Sch B	Sec Sch C	Sec Sch D
1.	40	35	30	30	80	40	30	80	40	40
2	5	25	3	3	?	1	4.5	?	?	15
3a	100	99	100	100	100	100	89	58	70	31
3b	98	63	89	90	50	90	91	83	85	0
4a	Y	Y	Y	Y	Y	Y	Y	No	No	No
b			NOT DETERMINED							
5	Y	Y	Some	Some	Some	No	Y	Y	?	No
6a	0	0	0	0	0	0	0	Some	Some	0
b			NOT DETERMINED							
7.	100	99	98	95	96	97	100	83	82	100
8.	100	100	100	100	100	100	100	100	100	33
9.	100	100	100	85	100	100	100	0	100	100
10.	100	100	100	100	100	100	100	100	0	0
11.	100	100	100	100	100	100	100	0	0	0
12.	75	100	100	?	60%	100	33	0	0	?
13.	1	1	1	7	3	7	7	99	99	99
14a	11	7.5	6	9	5	8	8	14	8	6.6
b			NOT DETERMINED							
15.	65	70	60	72	100	48	76	?	?	?
16.			NOT USED							
17A			NOT USED							
B			NOT USED							
18a		1			5					
b		.83								
c	6.5						1			
d		1.25	2.5	2.5		2.5	1.5			
e	6.5	3.08	2.5	2.5	5	2.5	2.5	0	0	0